

IN THE SPECIFICATION:

Please enter the following amendments to paragraphs 13-15, 28, 38 and 53. Also, please amend the header located just above paragraph [0028].

[0013] An additional system is provided according to an embodiment of the present invention for discarding a non-defective pipette tip, comprising an air pump with a nozzle, a pressure transducer, adapted to measure a change in air pressure in the nozzle as the pipette tip is acquired by the nozzle, and an ejection assembly adapted to eject a non-defective pipette tip.

[0014] Another method according to an embodiment of the present invention is provided for detecting a level of liquid in a container using a pipette tip, comprising moving the pipette tip toward the liquid in the container without aspirating through said pipette tip while detecting for a change in air pressure in said pipette tip, and ascertaining that the pipette tip has entered the fluid holding container when said change in air pressure is detected.

[0015] Lastly, another system according to an embodiment of the present invention is provided for detecting a level of fluid in a container using a pipette tip, comprising an air pump in communication with a nozzle, and a pressure transducer, adapted to measure a change in air pressure in the nozzle as the pipette tip is inserted onto the fluid holding container.

Detailed Description of the Invention Exemplary Embodiments

[0028] The various features of the exemplary embodiments of the present invention will now be described with reference to the drawing figures, in which like parts are identified with the same reference characters.

[0038] Controller assembly 700 communicates in a similar fashion with motor 302. Control/data bus 704A transmits control data to motor 302, which controls the movement of piston 210A of air pump 210. Pressure transducer 208 outputs an analog pressure

transducer (APT) signal 732, transmitted on analog signal line 706, which is connected to I/O 708B on controller board 726. For use in biotech and pharmaceutical industries, pressure transducer 208 is capable of detecting pressure with a resolution of 0.5 psi. After being received on I/O 708B, APT signal 732 is input to AMP/filter 714, which then outputs conditioned APT signal 734 to ADC 712. ADC 712 converts conditioned APT signal 734 to a digital word, which can be processed by processor 716. In this manner, processor 716 ascertains the air pressure in pipetter device 200, and the methods according to an embodiment of the present invention including determining the volume of liquid in pipette device 200, determining whether or not pipette tip 202 has entered fluid sample 218, and determining whether or not a defective pipette tip 202 has been acquired by the robotic arm, and if not defective, when it has been discarded.

[0053] However, the insertion of pipette tip 202 into fluid 218 by several millimeters to achieve reliable results may not be, under some circumstances, advantageous. Sometimes there is very little fluid to be spared, or, the fluid needs to be transferred as rapidly as possible. Therefore, and an alternative method for ascertaining when pipette tip 202 insertion has occurred is to move pipette tip 202 through the air-to-liquid interface 222 while pump 210 is aspirating. In this manner, an adequate signal is achieved when opening 220 of pipette tip 202 initially penetrates fluid 218. This approach allows detection of lower volumes of fluid 218 in small containers 216. Detection of volumes as small as a milliliter are possible because pipette tip 202 needs only penetrate the air-to-liquid interface 222 a very small amount.